

with the adaptations of water-plants (hydrophytes) on the one hand, and of desert-plants (xerophytes) on the other; with the adaptations of shade-plants and of those growing in full sun, especially as regards the protection of the chlorophyll. We have learned a great deal as to the relations of plants to each other, such as the peculiarities of parasites, epiphytes and climbing plants, and as to those singular symbioses (Mycorrhiza) of the higher plants with Fungi which have been found to be characteristic of saprophytes. Then, again, as to the relations between plants and animals: the adaptation of flowers to attract the visits of insects, first discovered by Sprengel (1793), has been widely studied; the protection of the plant against the attacks of animals, by means of thorns and spines on the surface, as also by the formation in its tissues of poisonous or distasteful substances, and even by the hiring of an army of mercenaries in the form of ants, has been elucidated; and finally those cases in which the plant turns the tables upon the animal, and captures and digests him, are now fully understood.

Conclusion.

Imperfect as is the sketch which I have now completed, it will, I think, suffice to show how remarkable has been the progress of the science during the nineteenth century, more particularly the latter part of it, and how multifarious are the directions in which it has developed. In fact Botany can no longer be regarded as a single science; it has grown and branched into a congeries of sciences. And as we botanists regard with complacency the flourishing condition of the science whose servants we are, let us not forget, on the one hand, to do honour to those whose life work it was to make the way straight for us, and whose conquests have become our peaceful possession; nor, on the other, that it lies with us so to carry on the good work that when this Section meets a hundred years hence it may be found that the achievements of the twentieth century do not lag behind those of the nineteenth.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

As was explained at length in our issue of March 22, in accordance with the new statutes of the University of London, a reconstituted Senate is to be elected shortly. The new Senate will be composed of the Chancellor, the Chairman of Convocation and fifty-four Senators, of whom sixteen are to be elected by Convocation. These sixteen members of the Senate will have, it would appear from the statutes, two distinct functions. They will, in addition to their general duties as senators, be required to form a special council for external students. This council, which is to consist of twenty-eight members of the Senate, will include the chancellor, the vice-chancellor, the chairman of Convocation, the sixteen senators elected by Convocation, and nine other members of the Senate elected by the Senate. Members of Convocation will, in a few days, proceed to choose their sixteen representatives; and, not unnaturally, there is considerable diversity of opinion as to the suitability of the nominated candidates. Two rival associations have sprung up. One body of graduates insists that the duties to be performed upon the council for external students should be considered of paramount importance in electing senators; the other, that their responsibilities as members of the Senate should be kept continually in view, because the work of the new University as a whole, but more especially the development of its teaching facilities, is of the most pressing nature. While admitting the necessity of safe-guarding the interests of the external student, and of ensuring the high value of the degrees of the University, it is desirable that every possible means of improving the higher education of London should receive primary consideration. It would be nothing less than a calamity were Convocation to elect sixteen irreconcilables with no ideas outside that of introducing the peculiar, though somewhat circumscribed, needs of the external student into all deliberations of the Senate. It is therefore to be hoped that the common-sense which attended the election of their representative in Parliament will characterise the selection of the sixteen senators chosen by Convocation. It is easily possible to find members of the University who, while fully aware of the needs, and in sympathy with the aims of the external student, have also broad views as to the work of a great teaching University.

NO. 1613, VOL. 62]

DR. A. P. LAURIE, lecturer in physics and chemistry at St. Mary's Hospital Medical School, has been appointed principal of the Heriot Watt College, Edinburgh.

DR. SPENCER W. RICHARDSON, lecturer on physics at the University College, Nottingham, has been appointed principal and professor of physics at the Hartley College, Southampton.

THE Birkbeck Institution, London, which has now completed seventy-seven years of educational work in the metropolis, commences its new session on Monday, October 1. The Institution has had many additions to its appliances in recent years, and the physical, chemical and metallurgical laboratories are now very thoroughly equipped. The day classes provide courses in chemistry, biology, physics and mathematics for the science degrees of London University. During the recess considerable additions and improvements have been made by the aid of a gift of 2000 guineas from Mr. F. Ravenscroft, to commemorate his completion of a membership of fifty years.

ADDRESSES will be given at the opening of many of the metropolitan and provincial medical schools at the beginning of October. At Middlesex Hospital on October 1, Dr. T. Clifford Allbutt, F.R.S., will distribute the prizes gained during the previous year and deliver an address. At St. George's Hospital the introductory address will be delivered by Dr. Francis G. Penrose. At University College the session of the faculty of medicine will be opened by Prof. G. Vivian Poore; the session of the faculty of arts and laws, and of science, will be opened with an address by Prof. F. W. Oliver on October 2. At St. Mary's Hospital the introductory address will be given by Mr. H. S. Collier. At St. Thomas's Hospital the session will open on Tuesday, October 2, when the prizes will be distributed by Sir William MacCormac. At the opening of the session at Charing Cross Hospital on October 2, Lord Lister will deliver the third biennial Huxley Lecture. The London School of Tropical Medicine will open on October 1, and the introductory address will be delivered by Sir William MacGregor, K.C.M.G., C.B., on Wednesday, October 3. At the London School of Medicine for Women the introductory address will be given on October 1 by Miss Aldrich Blake, M.S., M.D., after which the prizes for the past year will be distributed. At the Royal Veterinary College the introductory address will be delivered by Prof. McFadyean. The winter session at the University of Birmingham will begin on October 1 with an address by Prof. B. C. A. Windle. At University College of South Wales and Monmouthshire, Cardiff, the address will be delivered on October 1 by Sir John Williams. At University College, Liverpool, the Bishop of Liverpool will deliver an address on October 13 and distribute the prizes.

A SUMMARY of the scheme of work carried on by the Essex Technical Instruction Committee for the promotion of interest in the science of agriculture and other branches of knowledge bearing upon rural industries, has been prepared by Messrs. T. S. Dymond and J. H. Nicholas. The work is in every respect satisfactory, and should do much to broaden the views of the practical farmers of the county as to the value of agricultural education and experiment. Every year an educational excursion extending over several days is organised, the one this year being to Denmark to study dairy farms and dairying, high school and agricultural education, co-operation and organisation of agricultural industry there. Field experiments are carried out by arrangement with farmers distributed in all parts of the county, the advantage being that as demonstrations of the effect of manures, &c., they receive wider attention, and also that the experiments can be made on each of the different classes of land occurring in the county. Meetings of farmers are held in the experimental fields in each district at the season most suitable for studying the results of the experiments. The County Technical Laboratories at Chelmsford are now recognised as a centre from which information upon agricultural matters can be obtained. The advice of the staff is frequently sought on insect and fungoid pests, on difficulties met with in the dairy, &c., and their opinion asked on the value of foods and of fertilisers, and the best manurial treatment of land. As occasion arises, inquiries are undertaken on matters of agricultural importance, such as the chemical and physical effect of the salt water inundation upon agricultural land on the coast of Essex, and the best method for its amelioration. The agricultural work of the Essex Technical Instruction Committee is thus of the same character as that carried on by the Government

Agricultural Experiment Stations in the United States and elsewhere.

THIS is the time of year when prospectuses and calendars of Technical Colleges, Schools, and Institutes are received from various parts of the country in such numbers that it is impossible to do justice to them in a short note. Several publications of this character recently received must, however, be mentioned. The Northampton Institute, Clerkenwell, the principal of which is Dr. R. M. Walmsley, has greatly developed, and has commenced a set of day courses in mechanical engineering, electrical engineering and horological engineering. These courses have already been announced in NATURE, and their scope described. Other changes tending to the greater efficiency of the Institute have been introduced. A noteworthy point is that in many parts of the prospectus notes are given which should be of real value in making students understand what true education means, and in directing their energies in proper channels. The notes are in complete accord with rational methods of instruction.

THE Merchant Venturers' Technical College at Bristol has for many years been prominent among the technical schools of the country. It aims at providing a sound, continuous, and complete preparation for an industrial career, and has developed with the times. Among recent improvements mentioned in the calendar we notice that a much larger physical laboratory has been equipped and will be opened this session, and also an additional special laboratory for heat and mechanical physics.

THE prospectus of the Municipal Science, Art and Technical Schools of Devonport has been received. Remembering the tendency of students to skim over many subjects, instead of concentrating their attention on a few, we are glad to see among the regulations of the school the following note:—"Students are strongly advised not to attempt more than three subjects, one of which should be practical geometry or mathematics, and they should consult the teacher as to the course of study most suitable to their profession."

THE Municipal Technical School of Manchester is one of the finest in the country, and its syllabus for the session 1900-1901 is proportionally attractive. The following extract from the syllabus shows the relation of the work of the school to that of a University College. "The chief object of the school is to provide instruction in the principles of those sciences which bear directly or indirectly upon our trades and industries, and to show by experiment how these principles may be applied to their advancement. The aim of the school is distinct from that of the University Colleges, inasmuch as it is designed to teach science solely with a view to its industrial and commercial applications, and not for the purpose of educating professional scientific men. It, however, offers to students of the University Colleges the opportunity of technical instruction in the industrial applications of certain branches of science."

THE Calendar of the Royal Technical Institute, Salford, contains much good advice to students, and many sound remarks upon objects and methods of study. In the day classes of the Institute, the number of hours per week allotted to each subject in the first year is as follows:—mathematics 6; general physics (including mechanics) 4; practical physics 3; electricity (theoretical) 2; electricity (practical) 2; theoretical chemistry 2; practical chemistry 3; practical, plane and solid geometry 2½; drawing (freehand, model, &c.) 3; workshop practice 2; English and French 4; total 33½. The second and third years' courses become more specialised according to the department which the student proposes to enter. There is no compulsory course of instruction for evening students. Students are free to select those classes which will help them to make progress in their particular trade or business. They are warned, however, against strictly confining themselves to such classes; it is pointed out that if they desire to gain a thoroughly sound knowledge in technical subjects, the study of them should be preceded by several of the pure and applied sciences. Thus, for example, little real progress can be made in applied mechanics without a knowledge of the theoretical mechanics: or in machine or building construction without geometry; and unless the student undergoes systematic instruction in mensuration, arithmetic and mathematics, he will derive very little benefit from such subjects as steam, machine design, physics, &c. Mathematics has been aptly termed the alphabet of science, and students should not fail to acquire mathematical knowledge if they wish to make satisfactory progress in science and technology. The work of an Institute inspired with this spirit cannot fail to be of value.

NO. 1613, VOL. 62]

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, September 17.—M. Maurice Lévy in the chair.—Remarks relating to the decomposition of nitric esters and of nitroglycerine by alkalis, and on the relative stability of explosive materials, by M. Berthelot. In certain cases, instead of the production of the alcohol and nitrate as in the normal reaction, an aldehyde is formed, together with some nitrite. The results of M. Leo Vignon upon the nitrocelluloses confirm these views.—On the nomographic resolution of the equation of the seventh degree, by M. Maurice d'Ocagne.—On the deformations of contact of elastic bodies, by M. A. Lafay. Spheres of bronze and steel were studied and the amount of compression under varying loads measured by optical arrangements analogous to the Fizeau apparatus for the measurement of the expansion of crystals. The application of the theory developed by Hertz showed differences between the calculated and observed values which increased with the radius of the sphere. Since this divergence might possibly be due to the mutual friction of the surfaces in contact, experiments were made with oiled spheres, but the results were not affected by the lubrication.—Action of iodine and yellow oxide of mercury upon styrolene and safrol, by M. J. Bougault. Styrolene with iodine and mercuric oxide yielded an addition product, not obtainable pure, but apparently $C_6H_5 \cdot CHI \cdot CH_2 \cdot OH$, from which phenylacetic aldehyde was obtained by the action of silver nitrate. Safrol gives a similar addition product, but no aldehyde could be obtained from this by the action of silver nitrate.—On the reduction of the nitrocelluloses, by M. Leo Vignon. It has been shown in a previous paper that the nitration of cellulose yields, not nitrocelluloses, but nitro-oxycellulose containing an aldehyde group. With ferrous chloride, these bodies are reduced, the nitro-group being eliminated but the aldehyde group left intact. With ammonium sulphide, the reduction takes place in a different manner, cellulose or hydrocellulose being produced, substances without reducing action.

CONTENTS.

	PAGE
The Mammals of South Africa. By R. L.	521
Our Book Shelf:—	
Lewes: "Acetylene, a Handbook for the Student and Manufacturer"	522
Bottone: "Wireless Telegraphy and Hertzian Waves." —D. K. M.	522
Letters to the Editor:—	
Vibrissæ on the Forepaws of Mammals.—Frank E. Beddard, F.R.S.	523
The Distance to which the Firing of Heavy Guns is Heard.—J. W. Mallet	523
The Solidification of Alloys.—Fred. T. Trouton, F.R.S.	523
The Reform of Mathematical Teaching.—C. E. Stromeyer	523
Leaf Decay and Autumn Tints.—P. Q. Keegan	523
Homochronous Heredity and Changes of Pronunciation. —Charles G. Stuart-Menteth	524
The Daylight Meteor of Sunday, September 2.—T. Rooke; B. St. G. Lefroy	524
The Theory of Ions. By G. F. F. G.	524
The Recent Cretan Discoveries and their Bearing on the Early Culture and Ethnography of the East Mediterranean Basin. By Arthur J. Evans	526
The Ascent of Mount St. Elias (Alaska). (<i>Illustrated</i>). By G. W. L.	529
John Anderson, M.D., LL.D., F.R.S., &c. By W. T. B.	529
Notes	531
Our Astronomical Column:—	
Astronomical Occurrences in October	535
The Fireball of Sunday, September 2, 6h. 54m.	535
Ephemeris for Observations of Eros	535
Ephemeris of Comet Borrelly-Brooks (1900b)	535
Automatic Photography of the Corona	535
The Iron and Steel Institute	535
The Bradford Meeting of the British Association:— Section K.—Botany.—Opening Address by Prof. S. H. Vines, F.R.S., President of the Section	536
University and Educational Intelligence	543
Societies and Academies	544